

The Light company

Houston Lighting & Power South Texas Project Electric Generating Station P. O. Box 289 Wadsworth, Texas 77483

April 17, 1997

ST-HL-AE-5625

File No.: G26

10CFR50.73

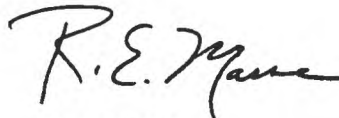
STI: 30246846

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

South Texas Project
Unit 2
Docket No. STN 50-499
Licensee Event Report 97-004
Unit Trip During Turbine Testing

Pursuant to 10CFR50.73, South Texas Project submits the attached Unit 2 Licensee Event Report 97-004 regarding a unit trip during turbine testing. This event did not have an adverse effect on the health and safety of the public.

If you should have any questions on this matter, please contact Mr. S. M. Head at (512) 972-7136 or me at (512) 972-7988.



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Plant Manager,
Unit 2

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KJT/

Attachment: LER 97-004 (South Texas, Unit 2)

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PDR ADDCK 05000499
S PDR



Project Manager on Behalf of the Participants in the South Texas Project

Houston Lighting & Power Company
South Texas Project Electric Generating Station

ST-HL-AE-5625
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CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9704240017 DOC.DATE: 97/04/17 NOTARIZED: NO DOCKET #
FACIL;STN-50-499 South Texas Project, Unit 2, Houston Lighting & P 05000499
AUTH.NAME AUTHOR AFFILIATION
HEAD,S.M. Houston Lighting & Power Co.
MASSE,R.E. Houston Lighting & Power Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 97-004-00: on 970319, unit trip occurred while performing
main turbine testing due to intermittent failure of inverter
power supply for channel two automatic stop trip valve.
Inverter power supply was replaced.W/970417 ltr.

DISTRIBUTION CODE: IE22T COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 5
TITLE: 50.73/50.9 Licensee Event Report (LER), Incident Rpt, etc.

NOTES: Standardized plant.

05000499

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INTERNAL:	ACRS	16 16	AEOD/SPD/RAB	2 2
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EXTERNAL:	L ST LOBBY WARD	1 1	LITCO BRYCE, J H	1 1
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NRC FORM 366 (4-95)				U.S. NUCLEAR REGULATORY COMMISSION				APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98 ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT			
LICENSEE EVENT REPORT (LER) (See reverse for required number of digits/characters for each block)											
FACILITY NAME (1) South Texas, Unit 2						DOCKET NUMBER (2) 05000 499		PAGE (3) 1 OF 3			
TITLE (4) Unit trip during turbine testing											
EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER	
03	19	97	97	-- 004	-- 00	04	17	97		05000	
									FACILITY NAME	DOCKET NUMBER	
										05000	
OPERATING MODE (9)		1		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)							
				20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)	
POWER LEVEL (10)		100		20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)	
				20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71	
				20.2203(a)(2)(ii)		20.2203(a)(4)		X 50.73(a)(2)(iv)		OTHER	
				20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A	
				20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)			
LICENSEE CONTACT FOR THIS LER (12)											
NAME Scott M. Head - Licensing Supervisor								TELEPHONE NUMBER (Include Area Code) (512) 972-7136			
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		
X	TG	INVT	X999	YES							
SUPPLEMENTAL REPORT EXPECTED (14)											
YES (If yes, complete EXPECTED SUBMISSION DATE).					X NO		EXPECTED SUBMISSION DATE (15)		MONTH	DAY	YEAR
ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)											
<p>On March 19, 1997, Unit 2 was in Mode 1 at 100% power. At approximately 1555 hours while performing main turbine testing, a unit trip occurred. All control rods fully inserted. The Engineered Safeguards Features System actuated the Auxiliary Feedwater System and Feedwater Isolation as expected for a reactor trip. All safety equipment operated as designed for a normal reactor trip. During post-maintenance testing on the Unit 2 Main Turbine Emergency Trip System, a condition developed that resulted in low Electro-Hydraulic Control System pressure causing a rapid closure of the main turbine throttle stop valves. The closure of the main turbine throttle stop valves resulted in a reactor trip followed by a main turbine trip. The cause of this occurrence was the intermittent failure of the inverter power supply for the channel two Automatic Stop Trip valve in the Electro-Hydraulic Control System. The inverter power supply was replaced and the condition of the other three inverters in the Electro-Hydraulic Control System were assessed and all were found to be in satisfactory condition.</p>											

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
South Texas, Unit 2	05000 499	97	-- 004 --	00	2 OF 3

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

DESCRIPTION OF EVENT:

On March 19, 1997, Unit 2 was in Mode 1 at 100% power. At approximately 1555 hours while performing main turbine testing, a unit trip occurred. All control rods fully inserted. The Engineered Safeguards Features System actuated the Auxiliary Feedwater System and Feedwater Isolation as expected for a reactor trip. All safety equipment operated as designed for a normal reactor trip.

On March 19, 1997, post-maintenance testing was being conducted on the Unit 2 Main Turbine Emergency Trip System after calibration of the Electro-Hydraulic Control System automatic stop pilot high pressure switch. When the channel one Automatic Stop Trip valves were cycled open as required by the test procedure, a channel two Automatic Stop Trip valve intermittently cycled opened. This condition resulted in low Electro-Hydraulic Control System pressure causing a rapid closure of the main turbine throttle stop valves. The closure of the main turbine throttle stop valves resulted in a reactor trip followed by a main turbine trip. Subsequent troubleshooting found that the inverter power supply to the channel two Automatic Stop Trip valve that cycled opened had an intermittent failure condition.

The plant is designed for a reactor trip followed by a turbine trip to occur on low Electro-Hydraulic Control System pressure. The maximum time allowed for the reactor trip breakers to open in the presence of a trip input is 167 milliseconds. A historical review of Unit 2 reactor trip breaker response time testing indicates a trip input must be present for approximately 30 milliseconds or greater for the breakers to open. The low Electro-Hydraulic Control System pressure condition had existed less than 30 milliseconds. Therefore, the low Electro-Hydraulic Control System pressure condition did not result in a reactor trip.

The plant is also designed for a reactor trip followed by a turbine trip to occur on turbine stop valve closure. The low Electro-Hydraulic Control System pressure condition was sensed by the Electro-Hydraulic Control System Fluid Turbine Trip Interface Low Pressure Switch. The result was a temporary loss of the turbine latch permissive causing the Electro-Hydraulic Control System to bias the main turbine stop throttle valves closed. This condition caused the unit trip.

There have been three previous failures of Automatic Stop Trip valve inverter power supplies at the South Texas Project. None of these failures resulted in a unit trip. The cause for the failed inverter in this occurrence was an intermittent voltage signal induced by a cold-soldered joint at the frequency adjust potentiometer termination point.

CAUSE OF EVENT:

The cause of this occurrence was the intermittent failure of the inverter power supply for the channel two Automatic Stop Trip valve.

LICENSEE EVENT REPORT (LER)
TEXT CONTINUATION

FACILITY NAME (1)	DOCKET	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	
South Texas, Unit 2	05000 499	97	-- 004 --	00	3 OF 3

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

ANALYSIS OF EVENT:

Reactor Trips and Engineered Safeguards Features Actuations are reportable pursuant to 10CFR50.73(a)(2)(iv). The reactor was brought to an orderly shutdown. All Engineered Safeguards Features functioned as designed. There were no adverse safety or radiological consequences of this event.

CORRECTIVE ACTION:

1. The inverter power supply that experienced intermittent failure was replaced.
2. The condition of the other three inverters in the Electro-Hydraulic Control System were assessed and all were found to be in satisfactory condition.

ADDITIONAL INFORMATION:

There have been no similar events reported by the South Texas Project to the Nuclear Regulatory Commission within the last three years.

Evaluation of the Main Turbine Emergency Trip System will be performed to consider possible system hardware enhancements. In addition, the preventive maintenance activity for testing the Main Turbine Emergency Trip System was inactivated pending enhancement of the associated implementing procedure.

The maintenance rule program monitors the reliability of the components in the Electro-Hydraulic Control System. Inverter failures are reviewed and classified as maintenance rule functional failures as applicable.

An industry review was conducted. Although several events occurred regarding Main Turbine Electro-Hydraulic Control Systems, none matched the failure mechanism that occurred in this event.